

SEQUENCE LISTING

<110> Rosanne M. Crooke  
Mark J. Graham

<120> ANTISENSE MODULATION OF MICROSOMAL TRIGLYCERIDE TRANSFER PROTEIN  
EXPRESSION

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Met Ile Leu Leu Ala Val Leu Phe Leu  
1 5

tgc ttc att tcc tca tat tca gct tct gtt aaa ggt cac aca act ggt 161  
Cys Phe Ile Ser Ser Tyr Ser Ala Ser Val Lys Gly His Thr Thr Gly  
10 15 20 25

ctc tca tta aat aat gac gac cggtt tac aag ctc acg tac tcc act gaa	209
Leu Ser Leu Asn Asn Asp Arg Leu Tyr Lys Leu Thr Tyr Ser Thr Glu	
30 35 40	
gtt ctt ctt gat cggtt ggc aaa gga aaa ctg caa gac agc gtg ggc tac	257
Val Leu Leu Asp Arg Gly Lys Gly Lys Leu Gln Asp Ser Val Gly Tyr	
45 50 55	
cgccatttcc tcc aac gtg gat gtg gcc tta cta tgg agg aat cct gat	305
Arg Ile Ser Ser Asn Val Asp Val Ala Leu Leu Trp Arg Asn Pro Asp	
60 65 70	
ggtgatgatgac cag ttg atc caa ata acg atg aag gat gta aat gtt	353
Gly Asp Asp Asp Gln Leu Ile Gln Ile Thr Met Lys Asp Val Asn Val	
75 80 85	
gaa aat gtg aat cag cag aga gga gag aag agc atc ttc aaa gga aaa	401
Glu Asn Val Asn Gln Gln Arg Gly Glu Ilys Ser Ile Phe Lys Gly Ilys	
90 95 100 105	
agccca tct aaa ata atg gga aag gaa aac ttg gaa gct ctg caa aga	449
Ser Pro Ser Lys Ile Met Gly Lys Glu Asn Leu Glu Ala Leu Gln Arg	
110 115 120	
cct acg ctc ctt cat cta atc cat gga aag gtc aaa gag ttc tac tca	497
Pro Thr Leu Leu His Leu Ile His Gly Lys Val Lys Glu Phe Tyr Ser	
125 130 135	
tat caa aat gag gca gtg gcc ata gaa aat atc aag aga ggt ctg gct	545
Tyr Gln Asn Glu Ala Val Ala Ile Glu Asn Ile Lys Arg Gly Leu Ala	
140 145 150	
agc cta ttt cag aca cag tta agc tct gga acc acc aat gag gta gat	593
Ser Leu Phe Gln Thr Gln Leu Ser Ser Gly Thr Thr Asn Glu Val Asp	
155 160 165	
atc tct gga aat tgt aaa gtg acc tac cag gct cat caa gac aaa gtg	641
Ile Ser Gly Asn Cys Lys Val Thr Tyr Gln Ala His Gln Asp Lys Val	
170 175 180 185	
atc aaa att aag gcc ttg gat tca tgc aaa ata gcg agg tct gga ttt	689
Ile Lys Ile Lys Ala Leu Asp Ser Cys Lys Ile Ala Arg Ser Gly Phe	
190 195 200	
acg acc cca aat cag gtc ttg ggt gtc agt tca aaa gct aca tct gtc	737
Thr Thr Pro Asn Gln Val Leu Gly Val Ser Ser Lys Ala Thr Ser Val	
205 210 215	
acc acc tat aag ata gaa gac agc ttt gtt ata gct gtg ctt gct gaa	785
Thr Thr Tyr Lys Ile Glu Asp Ser Phe Val Ile Ala Val Leu Ala Glu	
220 225 230	
gaa aca cac aat ttt gga ctg aat ttc cta caa acc att aag ggg aaa	833
Glu Thr His Asn Phe Gly Leu Asn Phe Leu Gln Thr Ile Lys Gly Lys	
235 240 245	
ata gta tcg aag cag aaa tta gag ctg aag aca acc gaa gca ggc cca	881

Ile Val Ser Lys Gln Lys Leu Glu Leu Lys Thr Thr Glu Ala Gly Pro			
250	255	260	265
aga ttg atg tct gga aag cag cag gct gca gcc ata atc aaa gca gtt gat			929
Arg Leu Met Ser Gly Lys Gln Ala Ala Ile Ile Lys Ala Val Asp			
270	275	280	
tca aag tac acg gcc att ccc att gtg ggg cag gtc ttc cag agc cac			977
Ser Lys Tyr Thr Ala Ile Pro Ile Val Gly Gln Val Phe Gln Ser His			
285	290	295	
tgt aaa gga tgt cct tct ctc tcg gag ctc tgg cgg tcc acc agg aaa			1025
Cys Lys Gly Cys Pro Ser Leu Ser Glu Leu Trp Arg Ser Thr Arg Lys			
300	305	310	
tac ctg cag cct gac aac ctt tcc aag gct gag gct gtc aga aac ttc			1073
Tyr Leu Gln Pro Asp Asn Leu Ser Lys Ala Glu Ala Val Arg Asn Phe			
315	320	325	
ctg gcc ttc att cag cac ctc agg act gcg aag aaa gaa gag atc ctt			1121
Leu Ala Phe Ile Gln His Leu Arg Thr Ala Lys Lys Glu Glu Ile Leu			
330	335	340	345
caa ata cta aag atg gaa aat aag gaa gta tta cct cag ctg gtg gat			1169
Gln Ile Leu Lys Met Glu Asn Lys Glu Val Leu Pro Gln Leu Val Asp			
350	355	360	
gct gtc acc tct gct cag acc tca gac tca tta gaa gcc att ttg gac			1217
Ala Val Thr Ser Ala Gln Thr Ser Asp Ser Leu Glu Ala Ile Leu Asp			
365	370	375	
ttt ttg gat ttc aaa agt gac agc att atc ctc cag gag agg ttt			1265
Phe Leu Asp Phe Lys Ser Asp Ser Ser Ile Ile Leu Gln Glu Arg Phe			
380	385	390	
ctc tat gcc tgt gga ttt gct tct cat ccc aat gaa gaa ctc ctg aga			1313
Leu Tyr Ala Cys Gly Phe Ala Ser His Pro Asn Glu Glu Leu Leu Arg			
395	400	405	
gcc ctc att agt aag ttc aaa ggt tct att ggt agc agt gac atc aga			1361
Ala Leu Ile Ser Lys Phe Lys Gly Ser Ile Gly Ser Ser Asp Ile Arg			
410	415	420	425
gaa act gtt atg atc atc act ggg aca ctt gtc aga aag ttg tgt cag			1409
Glu Thr Val Met Ile Ile Thr Gly Thr Leu Val Arg Lys Leu Cys Gln			
430	435	440	
aat gaa ggc tgc aaa ctc aaa gca gta gtg gaa gct aag aag tta atc			1457
Asn Glu Gly Cys Lys Leu Lys Ala Val Val Glu Ala Lys Lys Leu Ile			
445	450	455	
ctg gga gga ctt gaa aaa gca gag aaa aaa gag gac acc agg atg tat			1505
Leu Gly Gly Leu Glu Lys Ala Glu Lys Lys Glu Asp Thr Arg Met Tyr			
460	465	470	
ctg ctg gct ttg aag aat gcc ctg ctt cca gaa ggc atc cca agt ctt			1553
Leu Leu Ala Leu Lys Asn Ala Leu Leu Pro Glu Gly Ile Pro Ser Leu			

475

480

485

ctg aag tat gca gaa gca gga gaa ggg ccc atc agc cac ctg gct acc	490	495	500	505	1601
Leu Lys Tyr Ala Glu Ala Gly Glu Gly Pro Ile Ser His Leu Ala Thr					
act gct ctc cag aga tat gat ctc cct ttc ata act gat gag gtg aag	510	515	520		1649
Thr Ala Leu Gln Arg Tyr Asp Leu Pro Phe Ile Thr Asp Glu Val Lys					
aag acc tta aac aga ata tac cac caa aac cgt aaa gtt cat gaa aag	525	530	535		1697
Lys Thr Leu Asn Arg Ile Tyr His Gln Asn Arg Lys Val His Glu Lys					
act gtg cgc act gct gca gct gct atc att tta aat aac aat cca tcc	540	545	550		1745
Thr Val Arg Thr Ala Ala Ala Ile Ile Leu Asn Asn Asn Pro Ser					
tac atg gac gtc aag aac atc ctg ctg tct att ggg gag ctt ccc caa	555	560	565		1793
Tyr Met Asp Val Lys Asn Ile Leu Leu Ser Ile Gly Glu Leu Pro Gln					
gaa atg aat aaa tac atg ctc gcc att gtt caa gac atc cta cgt ttg	570	575	580	585	1841
Glu Met Asn Lys Tyr Met Leu Ala Ile Val Gln Asp Ile Leu Arg Leu					
gaa atg cct gca agc aaa att gtc cgt cga gtt ctg aag gaa atg gtc	590	595	600		1889
Glu Met Pro Ala Ser Lys Ile Val Arg Arg Val Leu Lys Glu Met Val					
gct cac aat tat gac cgt ttc tcc agg agt gga tct tct tct gcc tac	605	610	615		1937
Ala His Asn Tyr Asp Arg Phe Ser Arg Ser Gly Ser Ser Ala Tyr					
act ggc tac ata gaa cgt agt ccc cgt tcg gca tct act tac agc cta	620	625	630		1985
Thr Gly Tyr Ile Glu Arg Ser Pro Arg Ser Ala Ser Thr Tyr Ser Leu					
gac att ctc tac tcg ggt tct ggc att cta agg aga agt aac ctg aac	635	640	645		2033
Asp Ile Leu Tyr Ser Gly Ser Gly Ile Leu Arg Arg Ser Asn Leu Asn					
atc ttt cag tac att ggg aag gct ggt ctt cac ggt agc cag gtg gtt	650	655	660	665	2081
Ile Phe Gln Tyr Ile Gly Lys Ala Gly Leu His Gly Ser Gln Val Val					
att gaa gcc caa gga ctg gaa gcc tta atc gca gcc acc cct gac gag	670	675	680		2129
Ile Glu Ala Gln Gly Leu Glu Ala Leu Ile Ala Ala Thr Pro Asp Glu					
ggg gag gag aac ctt gac tcc tat gct ggt atg tca gcc atc ctc ttt	685	690	695		2177
Gly Glu Glu Asn Leu Asp Ser Tyr Ala Gly Met Ser Ala Ile Leu Phe					
gat gtt cag ctc aga cct gtc acc ttt ttc aac gga tac agt gat ttg	700	705	710		2225
Asp Val Gln Leu Arg Pro Val Thr Phe Phe Asn Gly Tyr Ser Asp Leu					

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gga ctt att ctg cta ata gat cat tct cag gaa ctt cag tta caa tct Gly Leu Ile Leu Ile Asp His Ser Gln Glu Leu Gln Leu Gln Ser 730 735 740 745	2321
gga cta aaa gcc aat ata gag gtc cag ggt ggt cta gct att gat att Gly Leu Lys Ala Asn Ile Glu Val Gln Gly Gly Leu Ala Ile Asp Ile 750 755 760	2369
tca ggt gca atg gag ttt agc ttg tgg tat cgt gag tct aaa acc cga Ser Gly Ala Met Glu Phe Ser Leu Trp Tyr Arg Glu Ser Thr Arg 765 770 775	2417
gtg aaa aat agg gtg act gtg gta ata acc act gac atc aca gtg gac Val Lys Asn Arg Val Thr Val Val Ile Thr Thr Asp Ile Thr Val Asp 780 785 790	2465
tcc tct ttt gtg aaa gct ggc ctg gaa acc agt aca gaa aca gaa gca Ser Ser Phe Val Lys Ala Gly Leu Glu Thr Ser Thr Glu Thr Glu Ala 795 800 805	2513
ggc ttg gag ttt atc tcc aca gtg cag ttt tct cag tac cca ttc tta Gly Leu Glu Phe Ile Ser Thr Val Gln Phe Ser Gln Tyr Pro Phe Leu 810 815 820 825	2561
gtt tgc atg cag atg gac aag gat gaa gct cca ttc agg caa ttt gag Val Cys Met Gln Met Asp Lys Asp Glu Ala Pro Phe Arg Gln Phe Glu 830 835 840	2609
aaa aag tac gaa agg ctg tcc aca ggc aga ggt tat gtc tct cag aaa Lys Lys Tyr Glu Arg Leu Ser Thr Gly Arg Gly Tyr Val Ser Gln Lys 845 850 855	2657
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 Cys Phe Phe Ser Ser Tyr Ser Ala Ser Val Lys Gly His Thr Thr Gly  
 10 15 20 25

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 Leu Ser Leu Asn Asn Glu Arg Leu Tyr Lys Leu Thr Tyr Ser Thr Glu  
 30 35 40

gtg ttt ctt gat ggg ggc aaa gga aaa ccg caa gac agc gtg ggc tac 195  
 Val Phe Leu Asp Gly Gly Lys Gly Lys Pro Gln Asp Ser Val Gly Tyr  
 45 50 55

aaa atc tca tct gat gtg gac gtt gtg tta ctg tgg agg aat cct gat 243  
 Lys Ile Ser Ser Asp Val Asp Val Val Leu Leu Trp Arg Asn Pro Asp  
 60 65 70

ggt gat gat gat caa gtg atc caa gtc acg ata aca gct gtt aac gtt 291  
 Gly Asp Asp Asp Gln Val Ile Gln Val Thr Ile Thr Ala Val Asn Val  
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gaa aat gcg ggt caa cag aga ggc gag aag agc atc ttc cag ggc aaa 339  
 Glu Asn Ala Gly Gln Gln Arg Gly Glu Lys Ser Ile Phe Gln Gly Lys  
 90 95 100 105

agt aca cct aag atc ata ggg aag gac aac ctg gag gct ctg cag aga 387  
 Ser Thr Pro Lys Ile Ile Gly Lys Asp Asn Leu Glu Ala Leu Gln Arg  
 110 115 120

ccc atg ctt cat ctg gtc cgg ggg aag gtc aag gag ttc tac tcc 435  
 Pro Met Leu Leu His Leu Val Arg Gly Lys Val Lys Glu Phe Tyr Ser  
 125 130 135

tat gaa aac gag cca gtg ggc ata gaa aat ctc aag aga ggc ttg gct		483	
Tyr Glu Asn Glu Pro Val Gly Ile Glu Asn Leu Lys Arg Gly Leu Ala			
140	145	150	
agc tta ttc cag atg cag cta agc tct gga act acc aac gag gta gat		531	
Ser Leu Phe Gln Met Gln Leu Ser Ser Gly Thr Thr Asn Glu Val Asp			
155	160	165	
atc tct ggg gat tgt aaa gtg acc tac cag gcc caa caa gac aaa gtg		579	
Ile Ser Gly Asp Cys Lys Val Thr Tyr Gln Ala Gln Gln Asp Lys Val			
170	175	180	185
gtc aaa att aag gct ctg gat aca tgc aaa att gag cgg tct gga ttt		627	
Val Lys Ile Lys Ala Leu Asp Thr Cys Lys Ile Glu Arg Ser Gly Phe			
190	195	200	
aca acg gca aac cag gtg ctg ggc gtc agt tca aaa gcc aca tct gtc		675	
Thr Thr Ala Asn Gln Val Leu Gly Val Ser Ser Lys Ala Thr Ser Val			
205	210	215	
act acc tac aag ata gag gac agc ttt gtc acc gct gtg ctt gca gaa		723	
Thr Thr Tyr Lys Ile Glu Asp Ser Phe Val Thr Ala Val Leu Ala Glu			
220	225	230	
gag acc agg gct ttt gcc ttg aac ttc caa caa acc ata gca gga aaa		771	
Glu Thr Arg Ala Phe Ala Leu Asn Phe Gln Gln Thr Ile Ala Gly Lys			
235	240	245	
ata gtg tca aag cag aaa ttg gag ctg aag aca act gaa gcc ggc cca		819	
Ile Val Ser Lys Gln Lys Leu Glu Leu Lys Thr Thr Glu Ala Gly Pro			
250	255	260	265
agg atg atc ccc ggg aag caa gtg gca ggt gta att aaa gca gtt gat		867	
Arg Met Ile Pro Gly Lys Gln Val Ala Gly Val Ile Lys Ala Val Asp			
270	275	280	
tcc aaa tac aaa gcc att ccc att gtg gga cag gtc ctc gag cgt gtc		915	
Ser Lys Tyr Lys Ala Ile Pro Ile Val Gly Gln Val Leu Glu Arg Val			
285	290	295	
tgc aaa gga tgc cct tct ctg gcg gag cac tgg aag tcc atc aga aag		963	
Cys Lys Gly Cys Pro Ser Leu Ala Glu His Trp Lys Ser Ile Arg Lys			
300	305	310	
aac ctg gag cct gaa aac ctg tcc aag gcc gag gct gtc cag agc ttc		1011	
Asn Leu Glu Pro Glu Asn Leu Ser Lys Ala Glu Ala Val Gln Ser Phe			
315	320	325	
ctg gcc ttc atc cag cac ctc cgg act tcg agg aga gaa gag atc ctc		1059	
Leu Ala Phe Ile Gln His Leu Arg Thr Ser Arg Arg Glu Glu Ile Leu			
330	335	340	345
cag att ctg aag gca gag aag aaa gaa gtg ctc cct cag ctg gtg gat		1107	
Gln Ile Leu Lys Ala Glu Lys Lys Glu Val Leu Pro Gln Leu Val Asp			
350	355	360	

gcc gtc acc tct gct cag act cca gac tcg cta gaa gcc atc ctg gac Ala Val Thr Ser Ala Gln Thr Pro Asp Ser Leu Glu Ala Ile Leu Asp 365 370 375	1155
ttt ttg gat ttc aaa agt gac agc agt atc ata ctc cag gaa agg ttc Phe Leu Asp Phe Lys Ser Asp Ser Ser Ile Ile Leu Gln Glu Arg Phe 380 385 390	1203
ctc tat gcc tgt ggc ttt gcc acc cac cct gat gaa gaa ctc cta cga Leu Tyr Ala Cys Gly Phe Ala Thr His Pro Asp Glu Glu Leu Leu Arg 395 400 405	1251
gcc ctc ctt agt aag ttc aaa ggt tcc ttt gca agc aac gac atc aga Ala Leu Leu Ser Lys Phe Lys Gly Ser Phe Ala Ser Asn Asp Ile Arg 410 415 420 425	1299
gag tcg gtt atg atc atc att gga gcc cta gtc agg aag ctg tgt cag Glu Ser Val Met Ile Ile Gly Ala Leu Val Arg Lys Leu Cys Gln 430 435 440	1347
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ctg gga gga ctt gaa aaa cca gag aag aaa gaa gac acc aca atg tac Leu Gly Gly Leu Glu Lys Pro Glu Lys Lys Glu Asp Thr Thr Met Tyr 460 465 470	1443
ctg ctg gcc ctg aag aat gcc ttg ctt ccc gaa ggc atc ccg ctc ctt Leu Leu Ala Leu Lys Asn Ala Leu Leu Pro Glu Gly Ile Pro Leu Leu 475 480 485	1491
ctg aag tat gct gag gct gga gaa ggg ccc gtc agc cac ctg gcc acc Leu Lys Tyr Ala Glu Ala Gly Glu Gly Pro Val Ser His Leu Ala Thr 490 495 500 505	1539
act gtt ctc cag aga tac gat gtc tcc ttc atc aca gat gag gtg aag Thr Val Leu Gln Arg Tyr Asp Val Ser Phe Ile Thr Asp Glu Val Lys 510 515 520	1587
aag acc ttg aac agg ata tac cac cag aat cgt aag gtt cat gag aag Lys Thr Leu Asn Arg Ile Tyr His Gln Asn Arg Lys Val His Glu Lys 525 530 535	1635
acg gtg cgc aca act gcc gct gtc atc tta aag aac cca tcc tac Thr Val Arg Thr Thr Ala Ala Val Ile Leu Lys Asn Pro Ser Tyr 540 545 550	1683
atg gat gtg aag aac atc ctg tcc att ggg gaa ctc ccg aaa gag Met Asp Val Lys Asn Ile Leu Leu Ser Ile Gly Glu Leu Pro Lys Glu 555 560 565	1731
atg aac aaa tac atg ctc acc gtt gtg caa gac atc ctg cat ttt gaa Met Asn Lys Tyr Met Leu Thr Val Val Gln Asp Ile Leu His Phe Glu 570 575 580 585	1779
atg cct gca agc aaa atg atc cgt cga gtt ctc aag gag atg gct gtt	1827

Met Pro Ala Ser Lys Met Ile Arg Arg Val Leu Lys Glu Met Ala Val			
590	595	600	
cac aat tat gac cgt ttc tcc aag agt gga tcc tct tct gcc tat act			1875
His Asn Tyr Asp Arg Phe Ser Lys Ser Gly Ser Ser Ala Tyr Thr			
605	610	615	
ggc tac gta gaa cgt agc ccc cgt gca gcg tcc aca tac agc ctt gac			1923
Gly Tyr Val Glu Arg Ser Pro Arg Ala Ala Ser Thr Tyr Ser Leu Asp			
620	625	630	
atc ctt tac tct ggc tct ggc att ctg agg aga agt aac ctg aac atc			1971
Ile Leu Tyr Ser Gly Ser Gly Ile Leu Arg Arg Ser Asn Leu Asn Ile			
635	640	645	
ttc cag tac atc aaa gga aca gag ctt cat ggt agt cag gtg gtg att			2019
Phe Gln Tyr Ile Lys Gly Thr Glu Leu His Gly Ser Gln Val Val Ile			
650	655	660	665
gaa gcc caa ggg ctg gaa ggc tta att gca gcc act cct gat gaa gga			2067
Glu Ala Gln Gly Leu Glu Gly Leu Ile Ala Ala Thr Pro Asp Glu Gly			
670	675	680	
gag gag aac ctt gac tct tat gct ggc atg tca gcc atc ctg ttt gat			2115
Glu Glu Asn Leu Asp Ser Tyr Ala Gly Met Ser Ala Ile Leu Phe Asp			
685	690	695	
gtt cag ctt agg cct gtc aca ttt ttt aat gga tac agt gat ttg atg			2163
Val Gln Leu Arg Pro Val Thr Phe Phe Asn Gly Tyr Ser Asp Leu Met			
700	705	710	
tcc aaa atg ctg tcg gca tcc ggc gac cct gtc agc gtg gtg aaa ggg			2211
Ser Lys Met Leu Ser Ala Ser Gly Asp Pro Val Ser Val Val Lys Gly			
715	720	725	
ctt att ctg tta ata gac cat tct cag gat att cag ctg caa tct gga			2259
Leu Ile Leu Leu Ile Asp His Ser Gln Asp Ile Gln Leu Gln Ser Gly			
730	735	740	745
cta aag gcc aat atg gag atc cag ggt ggt cta gct att gat att tct			2307
Leu Lys Ala Asn Met Glu Ile Gln Gly Gly Leu Ala Ile Asp Ile Ser			
750	755	760	
ggg tca atg gaa ttc agt ctg tgg tat cgc gag tct aaa acc cga gtg			2355
Gly Ser Met Glu Phe Ser Leu Trp Tyr Arg Glu Ser Lys Thr Arg Val			
765	770	775	
aaa aat cgg gtg gct gtg ata acc agc gac gtc aca gtg gat gcc			2403
Lys Asn Arg Val Ala Val Val Ile Thr Ser Asp Val Thr Val Asp Ala			
780	785	790	
tct ttt gtg aaa gct ggt ctg gaa agc aga gcg gag aca gag gct ggg			2451
Ser Phe Val Lys Ala Gly Leu Glu Ser Arg Ala Glu Thr Glu Ala Gly			
795	800	805	
ctg gag ttc atc tcc aca gtg cag ttc tca cag tac ccg ttc ttg gtc			2499
Leu Glu Phe Ile Ser Thr Val Gln Phe Ser Gln Tyr Pro Phe Leu Val			

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220  
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